

## CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

Sub R<sup>1</sup> 1.

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An electronic circuit test and repair apparatus, comprising:  
at least one wiring analyzer to locate circuit shorts;  
a current source to provide current sufficient to remove said shorts; and  
at least two probes to contact a circuit under evaluation.

Sub C<sup>1</sup> 2.

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The test and repair apparatus of claim 1, wherein said at least one wiring analyzer comprises at least one relay wiring analyzer and at least one solid state wiring analyzer, thereby providing at least two different testing speeds.

3. The test and repair apparatus of claim 1, further comprising a controller for automatic positioning of said at least two probes.

4. The test and repair apparatus of claim 1, wherein said at least two probes comprise a cluster probe.

5. The test and repair apparatus of claim 1, further comprising a controller having voltage stress test capability.

6. The test and repair apparatus of claim 1, further comprising a controller to automate at least one of locating of said circuit shorts and removing of said circuit shorts.

7. The test and repair apparatus of claim 1, wherein said at least one wiring analyzer additionally locates open circuits.

8. The test and repair apparatus of claim 6, wherein said controller performs a plurality of attempts to remove said shorts.

9. A method of testing and repair of wiring interconnect packages, comprising:  
contacting, at a predetermined set of locations, a wiring interconnect package under test using a cluster probe containing a plurality of probes;  
applying a predetermined set of voltage levels in a predetermined sequence to predetermined probes in said cluster probe;

measuring a response to each application of voltages to detect any open or short circuits in said wiring interconnect package; and

for any detected short circuits, applying a predetermined voltage to attempt to remove a detected short circuit,

5 wherein said applying of voltages and said measuring of responses to detect any short circuits uses a same apparatus that is used for said attempt to remove said short circuits.

10. The method of claim 9 wherein at least one of the following is automated:  
said contacting at a predetermined set of locations;  
said detecting of abnormal open circuits or short circuits; and  
said attempting to remove said short circuits.

11. A method of automatically testing and repairing wiring interconnect packages, comprising:

contacting, at a predetermined set of locations, a wiring interconnect  
15 package under test using a cluster probe containing a plurality of probes;  
automatically applying a predetermined set of voltage levels in a predetermined sequence to predetermined probes in said cluster probe;

automatically measuring a response to each application of voltages to  
detect any open or short circuits in said wiring interconnect package; and

for any detected short circuits, automatically applying a predetermined  
voltage to attempt to remove said detected short circuit.

- 5 12. The method of claim 11, wherein said detecting of any opens or shorts is  
executed at a first higher speed using a solid state switching module and said  
attempting to remove shorts is executed using a relay switching module.

13. The method of claim 11, where said contacting of said wiring interconnect  
package is additionally automatically actuated by a controller.

- 10 14. An apparatus for testing and repair of wiring interconnect packages,  
comprising:

at least one wiring analyzer to locate circuit shorts;

a current source to provide current sufficient to remove said shorts; and

a cluster probe to contact a wiring interconnect package under evaluation.

15. The test and repair apparatus of claim 14, wherein said at least one wiring analyzer comprises at least one relay wiring analyzer and at least one solid state wiring analyzer, thereby providing at least two different testing speeds.

16. The test and repair apparatus of claim 14, further comprising a controller  
5 to automatically position said cluster probe.

17. The test and repair apparatus of claim 14, further comprising a controller for a voltage stress test capability.

18. The test and repair apparatus of claim 14, further comprising a controller so that at least one of locating of said circuit shorts and removing of said circuit  
10 shorts is automated.

19. A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method of testing and repair of wiring interconnect packages, comprising:

contacting, at a predetermined set of locations, a wiring interconnect  
15 package under test using a cluster probe containing a plurality of probes;

applying a predetermined set of voltage levels in a predetermined sequence to predetermined probes in said cluster probe;

measuring a response to each application of voltages to detect any open or short circuits in said wiring interconnect package; and

for any detected short circuits, applying a predetermined voltage to attempt to remove a detected short circuit,

wherein said applying of voltages and said measuring of responses to detect any short circuits uses a same apparatus that is used for said attempt to remove said short circuits.

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